# Waste Management Committee

This committee addresses the treatment, storage and disposal of various waste streams. The committee's interest is in reducing the highest risk to the public, workers, and the environment by urging DOE to pursue a more integrated and comprehensive systems approach in its decision making process to include all risks, costs, and safety concerns associated with the various options involved with the decisions affecting SRS.

# WMC

- Members:
  - Ed Burke
  - Stan Howard
  - Rose Hayes
  - Kuppuswamy Jayaraman – end of term
  - Cleveland Latimore
  - Denise Long
  - Skyye Vereen

# Defense Nuclear Facilities Safety Board Recommendation 2001-1

- Need to address the critical shortage of tank space in the High Level Waste System (HLW)
- Avoid delays in the vitrification program & stabilization of nuclear wastes

- Recommendation is closed pending

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**
Washington, DC 20004-2901

December 7, 2011

The Honorable Steven Chu
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Chu:

The Defense Nuclear Facilities Safety Board (Board) issued Recommendation 2001-1, *High-Level Waste Management at the Savannah River Site* (SRS), to address the critical shortage of tank space in the high-level waste (HLW) system. This critical shortage threatened to delay stabilization of nuclear materials at SRS and potentially impact vitrification activities at the Defense Waste Processing Facility (DWPF). Once the Department of Energy (DOE) had addressed the immediate issue of leaks in an old-style tank, further corrective actions focused on selecting and developing salt processing capabilities and improving HLW management. The Board received DOE's letter dated November 8, 2011, describing the status of open commitments in the current Implementation Plan for Recommendation 2001-1. These few open items can be adequately tracked using the Board's normal oversight processes. Therefore, the Board closes Recommendation 2001-1.

During the last decade, DOE resumed operations at the Saltstone facility and started the Actinide Removal Process and the Modular Caustic Side Solvent Extraction Unit to process tank wastes. These efforts supported the removal of sludge wastes from about one-third of the old-style tanks. This sludge is being stabilized into glass at the DWPF. Furthermore, DOE returned Tanks 49 and 50 to normal service and significantly improved the availability of the 2H and 3H evaporators. Finally, DOE began issuing regular revisions to the HLW system plans and launched a series of initiatives to reduce waste inflows to the HLW system. Based on the above actions, the Board concludes that DOE has made satisfactory progress toward reducing the risks associated with old-style tanks and has met the intent of Recommendation 2001-1. The path forward for the open commitments is as follows:

- The Salt Waste Processing Facility (SWPF) project is mature—design and construction are currently 99 percent and 49 percent complete, respectively. The Board will oversee the remainder of this project using its normal oversight processes.

- The Board understands that new initiatives have reduced the near-term need to return Tank 48 to waste service. When the project is reactivated, the Board will oversee the design and construction of facilities necessary to eventually treat waste in Tank 48.



- The Board agrees with DOE's proposal to continue to use Tank 50 as a feed tank for Saltstone instead of modifying it for higher-curie material.

- DOE has committed to installing equipment to reduce the volume of DWPF recycle waste by 1.25 million gallons per year. The Board agrees with the proposal to coordinate this installation with the planned outage to physically connect the tank farms to SWPF.

Despite the significant progress noted above, DOE will face several challenges in the coming years that have the potential to increase the required service life of aging tanks and systems. In particular, when SWPF becomes operational, DOE will dramatically increase the processing rate for salt waste. This will, in turn, significantly increase the volume of decontaminated salt solution that must be processed through the Saltstone facility. The Saltstone facility has repeatedly shut down during the last few years as a result of plugging, pump failures, and other process upsets. The Board understands that during the first half of 2012, the operating contractor will attempt to improve the reliability of Saltstone by modifying much of the processing equipment. At the Board's public hearing in Augusta, GA, on June 16, 2011, DOE and its contractor discussed their intention to conduct a demonstration run to prove that Saltstone can reliably process decontaminated salt solution at the rates required for full-time SWPF operation. The Board considers this run to be of the highest importance, and looks forward to a full and thorough demonstration.

In closing, the Board remains concerned that challenges to the HLW system will lead to an extended mission for old-style tanks at SRS. The timescale for closing tanks has consistently fallen short of milestones set by DOE. The Board urges DOE to limit waste storage in the old-style tanks to that necessary to support waste removal and to expedite the closure of these tanks as a high priority. The Board will continue to track progress on waste removal and tank closure.

Sincerely,

Peter S. Winokur, Ph.D.
Chairman

c: Mr. David Huizenga
Dr. David C. Moody
Ms. Mari-Jo Campagnone

# 2012 Activities

- Develop 2012 Work Plan
- Review and Update Recommendations Status
  - Effects or responses and activities to date
  - Incorporate BRC report
- Develop new recommendations on:
  - SRS communicate plans for long term staffing of SWPF
  - Request to have Site communicate any changes in “Gear Chart” assumptions that effect future expectations
- Key Issues and Activities
  - SWPF completion and startup
  - Blue Ribbon Committee report and effects on Waste Management
  - Evolving plans for waste storage at SRS

# Waste Management Open Recommendations **Closable**

- 274 Liquid Waste Programmatic Risk Reduction – Spare Equipment and Spare Parts
  - 1/25/2011

**Recommendation:** The Savannah River Site Citizens Advisory Board recommends that DOE:

1) Describe how projected life expectations are determined and then utilized in the development of a list of spare equipment and spare parts.

2) Describe how the spare equipment and/or spare parts program is or is not consistent with shorter life history scenarios.

3) Identify areas of significant risk reduction and explain how these risk reductions relate to the spare equipment and spare parts budget.

4) For existing operations, identify areas where equipment life histories are being "pushed" because of operating rates or more extreme operating conditions. (For example: Defense Waste Processing Facility (DWPF) melter and off-gas system, Saltstone production equipment and sludge batch preparation equipment.)

5) For Salt Waste Processing Facility (SWPF), provide the strategy that will be used to determine equipment life and spare parts inventory.

# Waste Management Open Recommendations
# BLUE RIBBON COMMITTEE

- 270 Increase Loading of Excess Plutonium
  - 5/25/2010

**Recommendation:**

[redacted]

Recommendation amended to send a carbon copy to The Blue Ribbon Panel on Yucca Mountain.

# Waste Management Open Recommendations
## Ongoing Activities

- 269 Semi-Annual Review of the Inputs and Assumptions Used to Develop the Liquid Waste System Plan
  - 5/25/2010

**Recommendation:**

The Savannah River Site Citizens Advisory Board (SRS CAB) recommends the following:

1. Semi-annual review, starting the 4Q 2010, be conducted that discusses the status of the bases inputs and assumptions for the Liquid Waste System Plan. If these inputs and assumptions have changed then the impact of these changes should be discussed.
2. Semi-annual review of Salt and Sludge Processing Operations including MCU & ARP, DWPF, Saltstone, and base operations supporting these facilities.
3. Semi-annual review of Tank Closure timing and the overall program Critical Path items with emphasis on changes from the previous review.
4. Review of the ten highest programmatic risks that are embedded in the Liquid Waste Plan.
5. Review/status of the criticality studies relating to plutonium disposal in DWPF.

# Waste Management Open Recommendations

## Ongoing Activities- Review after BRC Report

- 263 Final Disposition for Nuclear Fuel, Surplus Plutonium, and Vitrified High Level Waste
  - 5/19/2009

The SRS CAB recommends that DOE:

1. Keep the CAB and the public informed on all decisions, risks and plans relating to the removal or long-term storage of surplus plutonium and nuclear waste at SRS.

2. In view of continuing political and legal action involving Yucca Mountain, indicate continued support for a "good faith" effort to remove all nuclear waste from SRS as soon as reasonably practical.

3. Make a commitment to involve key stakeholders (such as the State of SC) and the public in relevant planning and decisions involving SNF, Surplus Plutonium, and V-HLW at SRS. If public meetings or hearings are planned, schedule appropriate sessions in the Aiken/Augusta area.

4. By September 30, 2009, make a definitive statement on plans for the disposal of nuclear waste from the SRS to include:

   a. Plans and schedule for the DOE Blue Ribbon Panel (or similar panel) to develop a strategy for the disposal of HLW and SNF nation-wide, which includes determination of a specific nuclear waste repository site.
   b. Projection of a date when a preliminary schedule can be developed for the removal of HLW and SNF from SRS.
   c. Determination of limits of interim storage of an undefined duration for SNF, Surplus Pu, and V-HLW including existing and planned Glass Waste Storage Buildings.
   d. Additional studies necessary to evaluate the worthiness of long-term interim storage for SNF, Surplus Pu, and V-HLW at SRS beyond the presently established limits.
   e. Additional studies necessary to safely disposition the SRS SNF, Surplus Pu, and V-HLW at the final Federal Repository.

## Waste Management Open Recommendations

## Dated – Review Status

- 258 TRU Waste Disposition Program Follow-up
  - 9/23/2008

**Recommendation**

The SRS-CAB recommends that DOE-SRS:

1. Ensure the SRS funding for FY 2009 is at a level that continues to address the highest risk reduction activities to complete the removal of all legacy TRU waste no later than FY 2013.

2. Provide a FY09 budget update to the CAB when it is known and assess the plans for disposition alternatives for all SRS legacy TRU waste with the goal of disposition of all waste by 2013.

3. The CAB requests that DOE-SRS provide an update to the Committee and the Board on the status of TRU Pad 1 disposition scope and schedule.

4. Provide assurances that efforts are in place to step up obtaining the NRC license for the TRUPACT-III; invite the NRC to brief the CAB on obtaining the necessary license; and inform the CAB about what it can do to assist in resolving technical issues with TRUPACT-III to ensure meeting the 2013 end date.

5. Define completion date of WIPP certification of large box NDA and NDE systems and invite Carlsbad (WIPP) to discuss and outline steps with the CAB Waste Management Committee and Board and the appropriate regulatory parties to resolve technical issues with large box NDE to ensure meeting the 2013 end date.

# Waste Management Open Recommendations
## Needs Detailed Status Review

- 246 Supplemental Environmental Impact Statement for Surplus Plutonium Disposition at SRS
  - 5/27/2007

**Recommendation**

The SRS CAB recommends that DOE include the following analysis in the Supplemental EIS for Surplus Plutonium Disposition at the SRS:

1. The volume, type and constituents of each waste stream being generated by the disposition facilities.
2. The possible treatment options for each waste stream.
3. The preferred and selected treatment options for each waste stream.
4. The basis or reason for the selection of each identified treatment option.

Recommendation No.
Need to Continue On-going Progress for Closure of Tanks 18 and 19

**Background**

Savannah River Site (SRS) has been involved in an intensive program for the closure of the High Level Waste (HLW) Tanks at the Site for a number of years dating back to the 1990s. Early-on the regulatory criteria for cleaning and closure of the waste tanks were governed internally by Department of Energy (DOE) and externally by US Environmental Protection Action (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC). However, in 2005 the Site was granted legislative authority to close the tanks by the National Defense Authorization Act (specifically Section 3116) provided certain provisions were addressed. These provisions included among other items such requirements as cleaning the tanks to the maximum extent practical and disposition of wastes in accordance with certain performance objectives designed to protect the public and the Site workers. Also included in the legislation was the requirement that DOE consult with the Nuclear Regulatory Commission (NRC) relative to tank closure.

Update

To date two of the Site's 52 HLW tanks have been closed (Tanks 17 and 20) and several other tanks are in an advanced state of preparation for closure. The next two HLW tanks planned for closure are Tanks 18 and 19. Progress has not been as good on these tanks as the SRS Citizens Advisory Board (CAB) would like. For example, one earlier SRS System Plan (Life Cycle Liquid Waste Disposition System Plan Rev. 14.1 dated October 2007) had closure of Tanks 18 and 19 in FY 2007. The present System Plan Revision 16 shows closure of Tanks 18 and 19 in FY 2012. We have been advised that some of this delay results from the inclusion of additional modeling techniques proposed by the NRC. In November 2011 the CAB was advised that the NRC concurred fully with the closure measures for Tank 19 but still had some questions regarding tank inventory of radioactive materials and modeling for Tank 18. Hence, the NRC is taking a neutral posture on the closure measures for Tank 18.

At any rate FY 2012 is well advanced (FY 2012 began on October 1, 2011) and DOE and SCDHEC are undergoing an extensive final review, public input, and approval process with the goal of having a decision on the adequacy of closure measures early in calendar year 2012 (January/February timeframe).

**Comments**

Clearly the CAB is not in a position to make a technical judgment on the adequacy of measures taken to meet the tank closure criteria, but, DOE and its Contractor, Savannah River Remediation Company make a very convincing case that measures taken to date are adequate and proper. Further, there have been many technical measures taken from FY 2007 to FY 2011 to remove as much of the radioactive waste material from the tanks as practical. In addition, the NRC is not prepared to disagree with actions taken to date

with a strong technical basis; rather they are resorting to a "neutral" position pending further studies and analyses.

One of the models raising questions is the annual exposure that an individual would receive (less than 100 mrem of annual exposure) 100 meters from the Tank Farm 10,000 years from now. While we understand that is a requirement that the "modelers" are working, it seems unreasonably constraining since the average individual exposure in the US is approximately 310 mrem per year from natural causes. We also note that 10,000 years as a planning basis seems unrealistic from a "common sense" point of view.

We also note that cleaning of these tanks has been ongoing for several years and has been scrutinized closely by DOE, the NRC, EPA, SCDHEC, the Defense Nuclear Facilities Safety Board, SC Governor's Nuclear Advisory Council, and the National Academy of Sciences. This level of overview seems to be adequate in our view.

In view of likely budget cuts and the extent of effort to date it seems prudent to the CAB to get on with the closure action. The present schedule should be maintained for FY 2012. It is long been a concern of the CAB that tank cleaning would always be subject to ever increasing scrutiny and second guessing such that no matter how clean a tank is, there is always a desire to clean it more with additional upgraded techniques and further schemes.

Recommendations:

1. DOE should take extraordinary measures to meet or exceed the schedule for closure of Tanks18 and 19 consistent with the FY 2012 closure schedule and not delay closure unless significant safety issues are raised.
2. DOE and its supporting and related review organizations continue to provide updates to the public on closure progress for these tanks and all the remaining tanks scheduled for closure.
3. DOE develop a review of the lessons learned from this closure action and note improvements to accelerate future closures.